Heavy Artillery: Military Operations in Urban Terrain (MOUT)

A MONOGRAPH BY

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ABSTRACT

Heavy Artillery: Military Operations in Urban Terrain (MOUT)
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The purpose of this monograph is to answer the question; are current techniques and doctrine for fire support development capable of overcoming the challenges posed by future MOUT warfare? In doing so this monograph will explore current and future firing platforms, munitions and doctrine to determine if they meet the future challenges of fire support in a MOUT environment.

This is important because the effects of collateral damage from area fire weapons are the most difficult to control and in some instances the rules of engagement are such that certain weapon systems become prohibitive to use. With the increased technology and accuracy of indirect fire weapons and the use of smart munitions it may be possible to incorporate fire support systems in a MOUT environment that provides adequate firepower but also limits the amount of collateral damage incurred.

Evidence based on historical examples of the use of indirect fire weapons will demonstrate the need to use these systems in a in MOUT environments. Research on doctrinal fires support methods will be accomplished using current FM - 6 series, White Papers, and the Field Artillery Journal. Research on MOUT operations will be accomplished using FM 90-10, MCWP 3-35, FM 90-10-1, technical reports on weapons systems, and other associated publications. MOUT operations research will also be conducted through the MOUT web site and the use of numerous secondary sources available through agencies such as CALL.

Fire support technologies and doctrine currently under development are capable of overcoming the challenges posed by future MOUT warfare. The fire support community continues to develop firing platforms, munitions, and doctrine that will provide fire support in a future MOUT environment.

TABLE OF CONTENTS

Section I

Introduction

During the twentieth century virtually every military operation conducted by the United States has included fighting in cities or on some lesser type of urban terrain. Whether in Berlin at the closing of World War II or securing a small village in Vietnam, United States forces have always been faced with conducting urban operations. "In Panama, Somalia, Haiti, and Bosnia, control of urban areas was/is [sic] an essential component of mission success."[1] Today, more so than in the past, our geo-political environment is such that fighting on urban terrain has become even more increasingly probable. The desire to limit casualties and reduce collateral damage in these type of operations make them harder to plan and even more difficult to execute.

As the world's population centers continue to grow, urbanization of the cities and littoral regions becomes an increasingly greater factor in future military operations. Today's National Military Strategy is based on a power projection force. In order to project the force, air and sea lines of communications must be secured and in some cases seized. Operations requiring forced entry will more

than likely require the military to conduct military operations in urban terrain (MOUT) to secure some of those lines of communications. At a conference cohosted by the RAND Arroyo Center and the United States Army Infantry School's Dismounted Battlespace Battle Lab in February 1998, two assumptions were made concerning MOUT.

> 1. The United States will no longer conduct urban operations without significant ROE designed to reduce non-combatant casualties and collateral damage to infrastructure.
>
> 2. National decision making authorities will continue to perceive the American public as intolerant of large numbers of U.S. military casualties in all but exceptional circumstances.[2]

These assumptions, while valid, have a tremendous impact on the use and perception of indirect fire weapon systems. The perception is that indirect fire weapons create a great deal of collateral damage thus making them incompatible with MOUT.

> Artillery and other indirect fire systems are impractical in many situations; munitions with area rather than precision effects, round trajectories that cause preliminary impacts on structures near targets, and concussion danger to soldiers and Marines firing from enclosed areas are but a sample of the problems that confront commanders during urban combat operations.[3]

Where does the new multidimensional battlefield take the artillery community? Most of the weapon systems in the Army were developed to confront our Cold War adversaries.

In urban warfare, the terrain does not consist of rolling hills splattered with a few mountains, rivers, or valleys. Nor is it composed of the never ending desert of flatter regions in the world. MOUT, in a word, is "vertical". Anything from a two-story house to the forty-story building, to include its basements and the city sewer system, presents a challenge to the fire support community. Potential problems can range from masking, to communications, to precision targeting. Weapons systems were developed to deliver a mass of steel on an area target. To provide fire support that is on time and on target the mass of steel must be tamed to precisely hit its intended target.

One fact that remains with MOUT warfare -- it is intensely brutal. MOUT warfare produces a large amount of casualties, which includes both military and civilian personnel. Because of its destructive capability, the infrastructure of whole cities may be demolished as a result of a major battle. "Likewise, extensive damage to infrastructure may make rebuilding financially overwhelming for a friendly host nation, a defeated enemy, or even international aid sources."[4] It is the environment of MOUT operations that makes it so difficult to execute and train. Military operations require swift, decisive action at predetermined decisive points. MOUT requires the same but the requirements to conduct operations limiting collateral

damage and casualties preclude the use of overwhelming combat power as was seen in World War II battles similar to the fight for Stalingrad. Operations in the current and future MOUT environment are more successful when executed in a slow methodical manner.

Although many ideas exist to replace soldiers and Marines with machines on the battlefield, the MOUT environment requires so much flexibility that only the dismounted soldier or Marine can efficiently conduct such operations. In order to provide the soldier or Marine with sufficient firepower, the indirect fire community must develop systems that support the fighting man and are in line with current ROE and NCA expectations. Additionally, our adversaries are "aware of our increasing unwillingness to take casualties or cause major collateral damage, and understanding our lack of comparative advantage in the urban environment, U.S. adversaries are increasingly likely to engage our forces in cities."[5]

This leads to the primary research question of this monograph -- are techniques and doctrine for fire support currently under development capable of overcoming the challenges posed by future MOUT warfare? In order to answer this question several supporting questions must be addressed. These questions are as follows.

1. Why is the MOUT environment of concern to the Field Artillery?

2. What technological or doctrinal solutions exist or are under development to address challenges for Field Artillery in a future MOUT environment?

3. Are challenges to Field Artillery in a MOUT environment as identified in question 2 fully addressed?

Evidence based on historical examples of the use of indirect fire weapons are presented to demonstrate the need to use these systems in a MOUT environment. Research on doctrinal fire support methods is presented to establish the need to update doctrine based on current and expected future MOUT operations. Current and future fire support missions, firing platforms, and munitions will be examined to determine if they address future challenges in a MOUT environment.

The intended audience for this monograph includes all artillerymen, doctrine writers, and those interested in the MOUT environment.

Section II

History of Fires Support and its use in MOUT

A. Evolution of Fire Support Systems

The purpose of this section is to discuss the role of artillery and its relevance through the ages. Fire support and indirect fire weapons in particular have come full circle since their inception around 400 BC. The concept of delivering indirect fires was primarily born out of the need to assault castle walls and to break the sieges of earlier times. The systems that initially came into use were the catapult, balista, and the onager. These precursors to today's modern artillery hurled huge rocks and spears into or over walls without the aid of gunpowder. It was not until around the 4th century, when gunpowder was discovered[6], that artillery as we know it began to form and become one of the most destructive weapon systems on the battlefield.

With the introduction of gunpowder the manufacture of brass and steel cannons was not far behind. One of the first cannons developed was called the *pots de fer* (pots of fire)[7] by the French. This inaccurate, unruly system began

a mid 13th century arms race. This arms race primarily depended on the talents of local metallurgists who continued to produce large caliber cannons firing huge projectiles. The making of large caliber cannons and their use in warfare made significant changes to the battlefield.

The first real effective use of field artillery in Western Europe was in the closing years of the Hundred Years' War.[8] Charles VII is credited with establishing the modern artillery train thus mobilizing his artillery. The high quality of his cannons, their well-trained crews, and its added mobility contributed to Charles' French victory over the English[9]. Artillery then went into technological stagnation during the 16th century. It was not until the late 17th century that great strides took place in the manufacture and design of cannons. This, along with advances in rifling and manufacture of ammunition, solidified the importance of artillery on the battlefield.

By the middle of the 18th century, artillery had become militarized and shed the last remnants of its ancient guild status as tactics and technology once again changed the role of artillery. The effectiveness of artillery support depended on the siting of guns just prior to battle. As warfare evolved and technology continued to change improvements in the manufacture and use of artillery changed the way units fought. Improved carriages would provide

greater firepower and mobility for the warfare of the French Revolution and Napoleon.

Napoleon took full advantage of the maneuverability of his artillery and made it one of the most important tools of his operations. One of his favorite techniques was the employment of the *grand batterie*. This technique physically massed the preponderance of available artillery weapons in support of the main effort on the battlefield. Napoleon would literally blast a section of the enemy line to shreds to permit his infantry to advance.[10] The massing of artillery is still one of its most important attributes and the best technique in delivering devastating effects upon the battlefield. Napoleon is also generally credited with conducting warfare using the combined arms techniques.

Napoleon's combined arms techniques were carried over to the American Civil War. In the opening battles of the Civil War, commanders copied Napoleonic warfare. This was demonstrated at the First Battle of Bull Run. There Union commanders attempted to synchronize fire and maneuver using the same techniques one of Napoleon's corps commanders, Davout, did at Auerstadt. When the Union commanders moved up their artillery to fire on the enemy lines and clear a path for the infantry, they found the face of battle had changed significantly since the days of Napoleon. The accuracy and the range of the rifled musket made

artillerymen the ideal target for the infantry. Improvements in the manufacture of gunpowder and rifling of cannons soon improved the range and accuracy of American artillery pieces. With these technological improvements, artillery was able to fire from greater ranges with more accuracy, thus providing still more effective fire support to the infantry. In some instances, artillery was the decisive arm in battle. Artillery at Malvern Hill was one of the first times, on a grand scale, that cannons proved themselves in battle.[11]

Unlike the American theater of war during the Civil War, the European theater of war was more mature and used the advanced technologies of the mid 19th century to conduct warfare. The Franco-Prussian War in the 1870's is a good example of where new tactics and the introduction of rifling in artillery really took root.[12] The most prevalent change to artillery the Europeans used was rifled and breechloading cannons. Along with these improvements the Prussians continued to use combined arms tactics to prosecute the fight. During the Franco-Prussian war Prussian artillery arrived early on the battlefield and deployed in large numbers. Their gunners took up forward positions to provide close, effective fires to their line units. Prussian infantry learned that their survival lay in close cooperation with the cannoneers.[13] This close relationship

was carried over into the world wars and still endures today.

Although the mobility of cannons and ammunition changed, the relationship of artillery to the other combat arms remained the same throughout the two world wars. With technological improvements in recoil, siting, and mobility of indirect fire weapons, huge quantities of artillery were used during World War I to support its virtually immovable trench warfare. Cannons were lined up hub to hub on the battlefield and fired for hours prior to an attempt of an assault by the infantry. The firing of artillery provided a living hell as it churned the soil, rocked the earth, and sent shrapnel flying in every direction for all those that had to endure its undiscriminating wrath along the front lines. It would not be until the next world war that mechanization of artillery would increase its role on the battlefield as the most destructive and indiscriminate weapon on the battlefield.

World War II opened up with the introduction of armored warfare on a grand scale. The German *Blitzkrieg* demonstrated the potential power behind mechanization. Artillery pieces were towed by wheeled vehicles, or placed on tracked or half-tracked vehicles to provide mobility. This enabled an expansion of artillery's role on the battlefield and gave it the ability to provide indirect fire

support at lower echelons. Batteries and battalions of artillery were assigned to maneuver battalions, brigades, or regiments. This enabled the armor or infantry officer to place fires on targets they could not attack with direct fire weapon systems. World War II provided the opportunity for nations to conduct unlimited warfare with few restraints. World War II was the start of massive urban warfare on a scale of unprecedented carnage. For example, the battle of Stalingrad: "The battle was the greatest bloodbath in recorded history. Well over a million men and women died because of Stalingrad, a number surpassing the previous record of dead at the first battle of the Somme and Verdun in 1916.[14]" World War II completed the circularity of doctrine for indirect fires. While the earliest cannons were used to knock down castle walls and break up sieges, it was the modern artillery of World War II that was used to destroy the elaborate infrastructure of modern cities and wreak havoc much as it did in previous centuries. This use of artillery in the total destruction of cities was costly for both the attacker and defender. Since World War II, there has been a great desire to limit the use of artillery and other indirect fire weapons in cities because of the collateral damage that occurs. The historical accounts that follow will demonstrate the use of artillery in more modern

settings and the problems that arise from using it in a MOUT environment.

B. Historical Accounts of Fire Support in a MOUT Environment

The purpose of this section is to review the effects of heavy fire support in some of the most recent MOUT environments. This section describes the actions of three countries conducting MOUT operations over the past 30 years: the United States in Vietnam in their recapture of the city of Hue during the 1968 Tet Offensive; the Israeli's as they surrounded the Lebanese city of Beirut in 1982 executing Operation Peace for Galilee; and finally, a look at Russian urban tactics in the fight for Grozny during the Chechnya uprising in 1995. These historical accounts will demonstrate the destructiveness of MOUT operations, their implications, and the challenges that arise from using indirect fires in MOUT environments.

America and the Tet Offensive of 1968

The first historical example comes out of America's experience in the Vietnam War. Most think of the battles in Vietnam as taking place in the jungles. This was not so during the massive Tet Offensive conducted by the North Vietnamese Army (NVA) in 1968. The targeted areas of the

Tet Offensive were primarily large South Vietnamese cities where MOUT operations were conducted. During the Tet Offensive the NVA launched a campaign that was designed to de-escalate the war.[15] One of the objectives of the NVA was the Imperial City of Hue.

"Hue was the third largest city in South Vietnam, with a population of about 140,000. Located ten kilometers west from the coast of the South China Sea, and one hundred kilometers from the battle-scarred DMZ, Hue was the seat of government in the Thua Thien Province."[16] Militarily, Hue provided a critical line of communications to the American forces in Vietnam. A railroad and Highway 1 passed through Hue bringing supplies from Da Nang north to the DMZ. Although an important LOC, Hue was never really a large military center. It served as the cultural center of Vietnam. It was considered a place of learning where the traditions and values of the past were remembered and kept sacred.[17]

The attack on Hue occurred in the early morning hours of January 31, 1968. The local commander of Hue, Brigadier General Ngo Quang Truong was given word of the cancellation of the traditional New Year's cease-fire celebrating Tet. Although most of the men of the 1st ARVN division were on leave Brigadier General Truong was able to bring his staff to 100 percent alert.[18] In addition to the 1st ARVN

Division, American advisors from the Military Assistance Command Vietnam (MACV) and a small U.S. Naval Support Activity contingent were in the Hue City area. There were no field troops within the Hue area; most were garrison and staff troops.[19]

The 4th and 6th NVA Regiments along with the 12th VC and Hue City Sapper battalions attacked the thinly defended city of Hue. These units "controlled most of the city and were freely roaming the streets' within about 2 hours of launching the attack.[20] Forces of the 4th Regiment occupied the southern portion of Hue with the exception of the MACV compound. The 6th Regiment controlled the northern portion of Hue to include the area of the Citadel. The Citadel was built with the aid of the French in the 1800's. It had huge walls, was located within the city of Hue, and was modeled after the Chinese Forbidden City. The Citadel was full of moats, beautiful gardens, and intricate stone buildings.[21]

Initially, two and a half platoons belonging to Alpha Company, 1/1 Marines were sent to aid the defenders of Hue. The intelligence coming from the Hue area was extremely sketchy. The Marines attempting to repel the NVA did not expect to run into over 6,000 enemy soldiers. Not realizing what they were driving into, the members of Alpha Company ran into stiff resistance. As intelligence began to build

and the Marines provided feedback additional reinforcements were beginning to move into the Hue area. Along with the dispatched U.S. Marines, Vietnamese Marines and the 1st Cavalry Division (Airmobile) moved in to begin repelling the enemy from the imperial city of Hue.

Within a week the battle was reduced to deadly house to house fighting within The Citadel in an attempt to relieve it from the attackers. Rules of Engagement (ROE) initially prevented the Americans from using their indirect fire assets in Hue. ROE in Vietnam were very restrictive; especially in urban environments. An excerpt from the ROE follows.

> 3. URBAN AREAS.
>
> a. Fire missions directed against known or suspected VC/NVA targets in urban areas must preclude unnecessary destruction of civilian property and must by nature require greater restrictions than the rules of engagement for less populated areas.
>
> b. When time is of the essence and supporting weapons must be employed to accomplish the mission or to reduce friendly casualties, fire missions will be conducted as follows.
>
> (1) All fire missions will be controlled by an observer and will be executed only after GVN/RVNAF/US approval. The Decision to conduct fire missions in urban areas will be retained at corps/field force or NAVFOR level. Approval must be obtained from both corps commander and the U.S. field force level commander. This approval is required for the employment of any U.S. weapons in support of RVNAF.
>
> (2) Prior to firing in urban areas, leaflets and loudspeakers and other appropriate

means will be utilized to warn and to secure the cooperation and support of the civilian populace even though fire is received from these areas.

(3) Supporting weapons will only be used on positively located targets. When time permits, damage to buildings will be minimized.

(4) The use of incendiary type munitions will be avoided unless destruction of the area is unavoidable and then only when friendly survival is at stake.

(5) Riot control agents will be employed to the maximum extent possible. CS agents can be effectively employed in urban area operations to flush enemy personnel from buildings and fortified positions, thus increasing the enemy's vulnerability to allied firepower while reducing the likelihood of destroying civilian property. Commanders must plan ahead and be prepared to use CS agents whenever the opportunity presents itself.[22]

This set of ROE may have served well in most urban areas in Vietnam. However it was cumbersome and required a great deal of time to receive fires once the clearance process ran its course. Commanders were unable to get fires when they wanted them and by the time the artillery was able to deliver they were overcome by other events on the battlefield.

Once American and ARVN marines and soldiers made it into the Citadel little progress was made against the enemy. The troops that occupied this portion of Hue were resupplied and reinforced each night through the western gates of the fortress. As the battle continued and casualties mounted, the policy of not bombing or shelling Hue was lifted.[23] It

took three weeks of heavy bombing and intensive artillery fire for the Americans and South Vietnamese to free The Citadel and liberate Hue.[24]

The battle left the city of Hue in a state of ruin. The Citadel within Hue bore the brunt of the indirect fires during the recapture of Hue. It was hit with air strikes, naval gunfire and field artillery. It was estimated that over 10,000 houses were destroyed or damaged during the fighting, this equating to roughly 40 percent of the city.[25]

Colonel Winfield, the 1st Cavalry Division Artillery commander, summarized the artillery events as follows.

> In the battle for Hue, the brigade operating four battalions in the most conventional type of conflict that this division had ever been faced with. The brigade had their normal supporting artillery -- three direct support batteries, a medium battery, and, during the latter periods of the attack, an 8-inch battery. Those units, from the 3d to the 26th of February, fired 52,000 rounds. In addition, 7,670 rounds of 5-inch to 8-inch naval ammunition, and 600 tons of Air Force delivered munitions were expended in the area. In the last stages of the operation, the division commander and I went into Hue and worked with the commanding officer of the 1st ARVN forces. We took whoever was needed for fire control and clearance so that we wouldn't have any major accidents against U.S. Army, ARVN, or Marine unit or civilian, who were all converging on Hue. This required tight and rigid fire control, which was exercised by both the GS battalion commanders, by myself, and by senior officers whom I placed in Hue to control those fires. We had 11 fire support agencies in Hue. Now, this of course, had an effect on our infantry units, which are used to operating when they want to shoot --- they call for fire and the fire is there. When we have all these clearance requirements and you have to have minimum safe distance all around you, the fire becomes slow because of the clearance and becomes

> restricted both in the caliber of weapons and in the number of rounds you can fire.[26]

The problems the U.S. had in Hue were not uncommon to fighting in urban terrain. Once the decision is made to go in and seize a town or city it requires a combined arms effort. If the ROE is written to preserve the infrastructure of the town or city the time it takes to seize the area becomes even longer. With the requirement to clear fires at virtually every echelon, the system seems to become cumbersome and non-user friendly. In 1982, the Israelis in Beirut encountered some of the same problems that the Americans did in Hue. However, they chose to conduct a siege of Beirut instead of attacking into the city and conducting house to house fighting.

The Israeli Operation Peace for Galilee in 1982

War between the Palestine Liberation Organization (PLO) and Israel was bound to happen in 1982. Tension has always existed between the Jewish State of Israel and Muslim extremist groups and countries. Israel has continuously had to fight for its autonomy in this region. There were two factors that were bringing the PLO and Israel closer to war. "One was the PLO buildup in southern Lebanon, which was seen by a number of people in the Israeli cabinet as an increasingly serious military threat. The other was the

wish of the Israeli government to eliminate the destructive influence emanating from the PLO headquarters in Beirut, Lebanon's capital."[27]

Operation Peace for Galilee began on June 6, 1982 at 11 A.M. as three division-size task forces from the Israeli Defense Forces (IDF) crossed the border into Lebanon. It took eight days of fighting for the IDF to reach the outskirts of Beirut. After a final offensive to seal off the city and drive the Syrians out of Beirut, the IDF began the siege of Beirut on June 26. It was the original goal of the Israelis to coerce the PLO to come to terms rather than assault the capital city.[28] The Israeli decision to conduct a siege was primarily based on politics and the desire to not have a large number of Israeli soldier casualties. The Israeli's faced two problems once they had Beirut surrounded. The first was that most of the PLO fighters that were originally within grasp of the IDF had fled to the Bekaa Valley or were in Beirut. Once in Beirut they were able to join other entrenched PLO fighters. "From the Israeli perspective, the PLO in Beirut had to be dealt with."[29] Israeli cabinet members did not want to face having invaded Lebanon and loose a considerable number of soldiers and leave the PLO intact. The second difficulty the Israeli's faced was that they had virtually no experience with conducting urban warfare fighting.[30]

The decision to conduct a siege by Israel was probably the least costly to the Israelis politically, financially, and in terms of the number of Israeli solider lives saved. The siege of Beirut produced a different set of rules of war as opposed to an invasion of the city and conducting house to house fighting.

> Fundamental to siege warfare as it is defined by international rules of war is that it involves the civilian population. In any siege, great numbers of civilians are likely to be drawn into the battle area and will be killed, not only by accident, but quite deliberately, because their tasks, although civilian in nature, contribute directly to the military capacity of the defender. International law recognizes that in siege warfare the rules of engagement regarding civilians and noncombatants change.
>
> Traditional sanctuaries, churches, hospitals, schools, and civilian population areas, still exist, but their status may be seriously modified. They remain sanctuaries only as long as neither side makes tactical use of them. This places a much greater responsibility on the defender, who has the choice of maintaining the sanctuary status of these places or converting them into military assets.[31]

To assist in the siege of Beirut the IDF decided to make maximum use of air, naval, and artillery fire in a discriminate way. Although the IDF attempted to reduce civilian casualties during the siege, their policy of "disproportionate response" precluded this. Disproportionate response meant that the IDF reserved the right to hit military targets in civilian areas in retaliation and with a greater amount of firepower proportional to the attacks against their forces. This

policy resulted in a high number of civilian casualties and damage to the infrastructure of the city.[32] PLO tactics included placing military assets near civilian structures in an attempt to prevent IDF retaliation.

One tactic the PLO employed was the use of roving artillery. They would mount a small caliber mortar or artillery piece on the back of a truck, drive it to a specific location and fire upon the IDF forces. In retaliation, the IDF would implement its disproportionate response method and use sheaving as a method of retaliation. Sheaving artillery was the practice of massing a large amount of guns against a point target. All of the shells fired would hit the target within seconds of each other creating a devastating barrage of artillery that could level several houses or buildings at one time. Although the Israeli's fired upon civilian targets, the population of Beirut was warned prior to this occurring. The Israelis used leaflets and loudspeakers to warn the population of their tactics. The people in the city were given opportunities to leave prior to and during the siege "via the Israeli-controlled coastal highway."[33]

Since the Israelis controlled the heights around the city, they were able to use their artillery in a direct fire mode to facilitate attacks on military targets. The Israeli gunners would fire rounds at virtually point blank into the

sides of apartment complexes or buildings. These techniques had the tendency to either rubble several floors or completely destroy the building complex.[34]

According to the following excerpt, the Israelis appear to have devised methods to make their artillery an effective weapon system in the constrained environment of urban warfare.

> ...The effectiveness of artillery was limited by self imposed restrictions to limit property damage and civilian casualties. However, the artillery was technically very good. It made good use of new devices such as the RPV's which were flown over the battlefield to provide real-time intelligence through TV pictures of enemy targets. i[I]t used the new Rafael David fire-control computer system, which made it fairly effective at sheaving artillery and linking concentrated fires.[35]

The Israelis also made use of a new multi-option fuse that allowed adjustments in height or depth of the burst of the round. In Beirut, the IDF, with no prior experience, perfected their methods of sheaving which improved their responsiveness to PLO indirect fire attacks. Additionally, the IDF were able to perfect their method of "sniping" by firing large caliber rounds directly at PLO targets at point blank range.

Although the Israelis developed successful methods of implementing their artillery, they still encountered problems that were common to the American experience in Vietnam. During this war, civilian casualties and damage to

buildings were predominately from the use of artillery. However, the Israelis did not use the Russian tactic of indiscriminate shelling that almost resulted in the absolute destruction of Grozny.

Russian Invasion of Chechnya in 1994

In 1991, a two years after the fall of the Berlin Wall, Chechnya, a republic of the former Soviet Union, seceded from Russia. Consequently, Chechnya desired its independence from Russia and was willing to go to war for it. The economic importance of Chechnya was apparent to Russia. The territory was a rail link to the south and it refined more than 8 million barrels of oil a year in its refineries.[36] Chechnya produced over 6 per cent of Soviet oil output and its pipelines were essential for moving oil across the country for refining. These were not resources that President Yeltsin wanted to loose in his struggle to economically reform Russia. In November 1994, President Boris Yeltsin signed a secret order aimed at restoring the constitutional order and Russian legality over the territory of the runaway Chechen Republic.[37] This order tasked the defense minister with the disarmament and liquidation of armed formations in Chechnya.[38]

The Russian government believed that the resistance of the Chechens would be minimal and its operations would take

less than two weeks. However, this was not the case as the Russian government actually faced more than 45,000 armed Chechens. Additionally, the Russian army had no money. They were woefully undertrained, undermanned, and had poorly maintained equipment. "The Russian Army invaded Chechnya with a rag-tag collection of various units, without an adequate support base. When the Chechens stood their ground, the state to which the Russian Army had sunk became apparent to the world."[39]

The Russians first attempted to seize Grozny on December 31, 1994. They sent a brigade composed of some 1000 soldiers into the center of the city in an attempt to exploit an old Soviet tactic of capturing the city center to include its government from the march.[40] This did not occur as the Chechens let the Russians enter the city without any resistance. Once the Russians were in the city the Chechens blocked the exits and began systematically destroying the invading force at the city's central rail station. "By 3 January 1995, the brigade had lost nearly 800 men, 20 of 26 tanks, and 102 0f 120 armored vehicles. Frustration ran high in the Russian army and retribution was swift. For the next 20 days and nights Russian artillery rounds rained haphazardly down on the city, sometimes at a rate of 4,000 per hour."[41]

The Russians failed miserably to appreciate the level of preparedness of the Chechens forces. When the Russian Army looked at the Chechens they could only see a picture of their former selves. The Chechens spoke Russian, had served in the Russian military, knew Russian tactics, and had Russian equipment. "By one account the Chechens had 40 - 50 T-62 and T-72 tanks, 620-650 grenade launchers, 20-25 "Grad" multiple rocket launchers, 30-35 armored personnel carriers and scout vehicles, 30 122mm howitzers, 40-50 BMP infantry fighting vehicles, some 200,000 hand grenades, and an assortment of various types of ammunition."[42]

During the battle the Russians had the opportunity to use precision guided artillery ammunition but chose against that option. This ammunition included the Smelchak, a 240-mm guided mortar, and the Santimetr, a 152-mm guided artillery round; both projectiles are used in conjunction with laser-target indicators and range finders. The reason given for not using these precision munitions "is that these highly advanced armaments were too expensive to be "wasted" in Chechnya and needed to be used for more serious contingencies."[43] It would seem that mobilizing a large portion of the nation's armed forces to quell violence within a republic that the nation requires to survive economically would be reason enough to attempt to limit the collateral damage inflicted by indirect fires.[44]

In order for the Russians to maintain control of Chechnya and its resources, the central government would have to maintain some sort of military presence in the republic and rebuild its necessary infrastructure. The Russian government initially spent over 400 billion rubles on the war by the end of December 1994 and was estimating that it would cost several trillion more rubles to rebuild the republic. Additionally, the Russian government would potentially maintain a troop level of 40,000. In total these costs amount to the equivalent of $5 billion dollars U.S., which is equivalent to 2.5 per cent of Russian GNP, a sum of money that the Russians could not afford.[45]

The use of artillery in Grozny became counterproductive for the Russian forces. Their use of indiscriminate shelling helped turn the local population against them and most of the population that was killed or wounded were the Russian citizens that lived in the city center.[46] There are several accounts of artillery bombardments.

> 21 December -- in concert with Russian jets there is indiscriminate shelling of targets with long range artillery assets allegedly targeting industrial and utility sites within the city. Some targets were hit in addition to an orphanage, a hospital, and several other non-military targets.
>
> 7 January -- Artillery fire support was estimated at 15-20 rounds per minute crumbling Grozny.
>
> 8 January -- Artillery bombardments intensify to 12 rounds per minute in support of an attack on a railroad station. The attack was beaten back by the rebels.

13 January - In a two hour period artillery shells indiscriminately rain on the city at a rate of 20 rounds per minute.[47]

Although the Russians shelled indiscriminately, they did use sophisticated remotely piloted vehicle (RPV) for the first time in combat. They were able to use the RPV to identify and locate targets; sending these details directly to their artillery command vehicles.[48]

The Russians learned that conventional artillery fires were useful during the approach to the city and while capturing the city outskirts. The Russians deployed the bulk of their self-propelled artillery in direct support of tanks and infantry. Since massed artillery fire creates rubble in the very areas through which a force wants to advance, direct-fire was found to be preferable. However, when Russian forces arrived in Grozny they had few fire support coordinators and forward air controllers.[49] Therefore, the Russians reverted to indiscriminate shelling of the city in the hopes of breaking down and destroying the Dudayev army it came to fight.

Other problems the Russians encountered were with communications. Since cities are vertical and building tend to mask radio waves, the high-rise buildings and towers in the city impeded the transmission of radio waves. The Chechens on the other hand use Motorola and Nokia cellular

radios to command and control their units. The poor radio transmission of the Russians forced them to use their army aviation to call for and adjust artillery fires.[50]

The Chechen operation posed several problems for fire support coordination.

> -- Russians were unable to mass their artillery assets due to their lack of training and coordination.
>
> -- Although UAVs and aviation was used the primary means of target acquisition was by artillery and maneuver unit commanders.
>
> -- Operations tempo was so high for the artillery units that many gun crews were tired which could account for many inaccuracies in firing.[51]

The Russian operation in Chechnya was unconstrained by today's standards with regard to concerns of collateral damage and civilian casualties. Although they considered themselves successful, the Russians proved that urban combat is demoralizing, resource draining, politically costly, and time consuming.[52]

These three historical accounts represent the use of artillery in three different ways. The Americans in Hue at first attempted to not use artillery and then were forced to once they realized the city could not be seized. The Israelis put into practice techniques to limit collateral damage and civilian casualties, however their army did not enter the city of Beirut. They had a well thought out and integrated plan for using their indirect fires. The

Russians on the other hand used indiscriminate shelling as a technique for destroying the rebels in Grozny resulting in the destruction of most of the city center.

Common challenges encountered in each of these historical events are as follows.

-- Poor communications in an urban environment

-- Limiting collateral damage

-- Clearing fires

-- Targeting accuracy and selection

-- Limiting civilian casualties

-- Lack of doctrine

-- Lack of clear tactics, techniques, and procedures

These challenges are addressed in the next section.

Section III

Challenges in MOUT for Fire Support

As noted in the previous section, indirect fires were used by the Americans, Israelis, and the Russians in three different ways. Although they implemented different methods of applying their fire support they all encountered somewhat similar challenges. Regardless of the decade, each of these countries wrestled with ways to use fire support to compliment their method of conducting MOUT or, as in the case of Israel, the siege of Beirut. Although not all inclusive the primary problems encountered by the Americans, Israelis, and Russians are captured in the following paragraphs.

The most prominent problem encountered by each of the countries was in their efforts to limit collateral damage and civilian casualties. The desire by most governments to minimize damage to urban areas and civilian casualties will probably never go away. If anything, governments become more restrictive as politicians desire to preserve infrastructure and care for the local population. In Hue, American's goal not to use indirect fires within the Citadel was motivated by a desire to preserve it because of its

historical significance to the people of Vietnam. As the battle progressed and casualties mounted, it was decided to use any and all indirect fires available to support the house to house fighting. Although the standard ROE was still in effect, the damage done within the Citadel was devastating. In Beirut, although the Israelis took siege of the city, their practice of "disproportionate response" destroyed whole rows of homes and buildings in devastating salvos of artillery fire. Additionally, by using artillery in a direct fire role to counter sniper fire in buildings, the IDF created damage to buildings by using devastating firepower overmatch. In Chechnya, the Russians essentially laid waste to the city center of Grozny in an attempt to destroy the opposing army without the use of troops. This only exasperated the situation and destroyed the infrastructure they needed to protect. By doing so, the Russians alienated themselves even further from the Russian population that lived in Grozny.

Along with creating unwanted collateral damage and civilian casualties all three countries had problems with hitting targets accurately and target selection. Indirect fire weapon systems are inherently area fire weapons. One of the reasons it is difficult to hit targets accurately involves the number of variables used to determine firing data for the round to get to the target. Most of the

variables that come into play fall under the five requirements for accurate predicted fire. They are found under the following categories: calculation of firing data for the weapon system, disparities in the manufacture of ammunition, the inconsistencies in firing platform performance, determination of target locations, and meteorological information. Errors within these categories, when not accounted for in the gunnery solution, prevent rounds from landing on target. One of the reasons the Russians had problems with accurately determining target locations was their lack of forward observers in the combat zone. Although they had RPVs to conduct some targeting, they did not have enough to cover the whole urban battlefield. Additionally, their crews were worn down from constantly shooting which, when conducting crew drill on the weapons systems or calculating firing data, can produce errors. For the Israelis, their policy of "disproportionate response" was conducted without much thought of where they wanted the rounds to land. Indiscriminate targeting can lead to the destruction of critical infrastructure or increase civilian hostility towards the attacker. Since the Israelis were conducting a siege, they did not have to follow convential international ROE in preserving the sanctity of certain targets if the PLO used them to attain their military goal.

Another problem encountered by all three countires occurred with clearing fires in the battle zone. Clearing indirect fires in any battle is difficult and because of the make up of the urban environment, it is even more difficult. In the urban environment, it is difficult to determine the accurate location of all attacking units in relation to the defending enemy. This can create problems such as fratricide, the unwanted destruction of certain components of the urban area's infrastructure, and even greater civilian casualties. Because of the nature of MOUT and restrictions by international law, clearing fires becomes a burdensome process that slows down the delivery time of indirect fires. Requests for clearing fires may have to go through several layers of command before they are approved and, once the approval is granted, it can take some time for the approval to get to the unit delivering the fires. Once approval is granted and the delivering unit receives permission to shoot, the situation may have changed so much that the fires are no longer needed. This may become detrimental to the man on the ground that is counting on his indirect fire assets to assist his unit in destroying the enemy. In the American situation in Hue, the local artillery commander had eleven fire support agencies working fire support issues in an attempt to get fires cleared as quickly as possible. Each layer has the potential to create

confusion and slow the process even further. The Russians on the other hand practiced indiscriminate shelling and let the commander on the ground determine whether or not artillery would fire on a target. Their policy obviously delivered fires quicker but since they indiscriminately destroyed buildings they obviously were not concerned with limiting collateral damage.

A problem connected to clearing fires is having appropriate communications in an urban environment. The Russians appeared to have the greatest problem with this during their attempt to seize Grozny. While they had their older FM radio communications, their rebel opponents were using the latest satellite technology to communicate with each other. While Chechen rebels had access to cellular phones and Motorola's, the Russian army had to use their aviation assets as communications platforms. The biggest challenge to FM communications in an urban environment is the masking of radio waves from the structures within the city. Since the city is vertical and all most of the action takes place in the streets or in buildings, it is difficult for radio waves to travel to their intended destination.

In all three urban environments discussed in the previous chapter, the lack of doctrine and any type of tactics, techniques and procedures created the greatest challenges in conducting urban warfare. The Americans

waited until the battle heated up prior to integrating indirect fires within the battle for the Citadel. The United States Army does not have current field manuals on MOUT. Field Manual, 90-10 *MOUT,* was published in 1979. Its sister manual FM 90-10-1, *An Infantryman's Guide to Combat in Built-up Areas,* was published in 1993. The United States Army Field Artillery School's most recent publication on MOUT and fire support is a White Paper published in February 1989. The United States Marine Corps published Marine Corps Warfighting Publication (MCWP) 3-35.3, *Military Operations on Urbanized Terrain* in 1998. The Israelis decided upon tactics to support their operation but their practice of "disproportionate response" does not bode well with the civilian populace or the international community. The Russians appear to lack any reasonable sound implementation of indirect fires with their attack on Grozny.

Although it is impossible for any army to prosecute a clean and orderly battle, it is more difficult in an urban environment. There are many references to "surgical warfare" where a single technological solution becomes the panacea for fixing problems encountered upon the battlefield. For the indirect fires community, as in most other communities, there is no one system that can solve all of the problems in urban warfare. Nor does the artillery community have the ability to solve all problems involving

urban combat. Not every city or urban environment is the same and problems solved for one urban environment may not work in the next urban environment. There are some things that the artillery community is working on that can be applied in the urban environment. Solutions or potential solutions to these problems are discussed in the following section.

Section IV

Technological and Doctrinal Solutions for Field Artillery in a MOUT Environment

The purpose of this section is to discuss technological and doctrinal solutions that currently exist or are under development to address the challenges from the previous section for Field Artillery in a future MOUT environment. Technological solutions to the MOUT challenges encompass future and current weapon platforms, several new types of munitions, and command and control systems. Some of the challenges MOUT presents to the Field Artillery community are generally solved by more than one of these technical or doctrinal solutions.

A. Weapon System Platforms.

The United States Field Artillery has one current and two future weapon system platforms. They are the current Paladin howitzer, the future Crusader howitzer, and the future Lightweight (LW) 155.

The Paladin howitzer system has replaced every M109A5 and previous 155 tracked howitzer system in the active component of the U.S. Army. The last active duty unit was

fielded in FY 1997 at Fort Riley, Kansas, it is expected that all National Guard battalions will receive the Paladin by FY 2001.[53] The Paladin system offers the Army a completely upgraded howitzer on the M109 chassis and continues to be the primary indirect fire support system for all heavy divisions and armored cavalry regiments. The Paladin is well known for its "shoot and scoot" technology within the artillery community. This means that it has the ability to receive a digital fire mission on the move, stop, orient, shoot the mission, and then scoot away from its current position to avoid counterfire from threat artillery. This technology is beneficial in the MOUT environment, not so much for its ability to scoot from the threat, but for its ability to use the onboard Automatic Fire Control System (AFCS) to calculate fire missions accurately and in a timely manner. By allowing the AFCS to calculate fire missions if reduces the inherent human errors. This onboard system also has its own navigational system to accurately locate the howitzer on the ground. The navigational system alleviates the need for manually calculating the howitzer's location on the ground and inducing errors in those calculations. Accurate weapon system location and automated computation of firing data are important elements in determining accurate predicted fires. Not only does the AFCS have the ability to calculate technical firing data, it also has a muzzle

velocity measuring system, and gun drive servos, which automatically orient the gun tube on the correct deflection and quadrant.[54] This also assists in reducing error caused by human intervention.

In addition to the AFCS, the Paladin has the modular azimuth positioning system (MAPS) integrated into the navigational system. MAPS is composed of three sub-systems. It consists of the dynamic reference unit hybrid (DRU-H) which houses all necessary sensor electronics to perform survey and orientation functions in conjunction with the MAPS two other systems. The vehicle motion sensor (VMS) converts the vehicle odometer outputs to electronic signals to measure vehicle displacement or movement. The final sub-system of the MAPS is its global positioning system (GPS)/precision lightweight GPS receiver (PLGR). The GPS/PLGR feeds satellite-positioning information into the DRU-H thus assisting in the determination of the Paladins accurate location.[55]

Another feature of the Paladin that assists in the prosecution of a future MOUT fight is the linkage that can be established between the Paladin and the forward observer. This linkage allows the observer to "talk" digitally directly to the Paladin howitzer. Command relationships must be developed between the howitzer and the observer on the ground. This type of sensor-to-shooter linkage allows

the observer to get fires quicker than if the fire mission has to be processed through the task force fire support element (TF FSE), through the battalion fire direction center (FDC) and then down to the battery and subsequent platoon or battery of Paladins that will conduct the fire mission.[56]

With the Paladin's ability to establish sensor to shooter links, it reduces the mission processing times for the observer. This is beneficial if the Paladin is in a direct fire mode supporting an infantry or armor unit in the urban area. On the other hand, this type of sensor-to-shooter linkage may not be established if the Paladin is in the indirect fire mode outside the urban area and the fires clearance process must pass through several layers. The fire mission may have to be approved by a higher headquarters. Although the AFCS and MAPS systems do not account for all of the requirements of accurate predicted fire they exist to help reduce error on the gunline. By using these systems, error is reduced aiding in delivering accurate fires to the target location; essential to reducing collateral damage and civilian casualties. Additionally, fires become more responsive to the maneuver commander's needs on the battlefield.

There are two future indirect fire platforms the Army is developing for the next battlefield. The Crusader

program is the Field Artillery's next generation cannon artillery system. This next generation howitzer will have the ability to keep up with the M1A2 main battle tank and the Bradley Fighting Vehicle (BFV) facilitating its crucial role as part of the combined arms team.[57] The technology used to develop the Crusader is expected to provide the blueprints for future army ground systems.[58] The Crusader will continue to deliver fires from the family of 155-mm projectiles. Crusader is designed to provide improved capabilities in range, rate of fire, timeliness, accuracy in delivery of rounds, survivability, mobility, and automated ammunition handling.[59] The Crusader system will revolutionize the way maneuver commanders will use indirect fires in the future and can have a significant impact on the deliver of indirect and direct fires in a MOUT environment. It is not only the ability of the Crusader to move swiftly upon the battlefield that will provide benefits in the MOUT environment, but also its ability to attack targets accurately in a timely fashion that will enable this future system to play a crucial role in MOUT.

Crusader technology will play a major role in the delivery of fires in a MOUT environment. Not only will Crusader be noted for its tactical mobility, it will be known as the most accurate artillery system in the world. This future system will have the ability to conduct multiple

round simultaneous impact (MRSI) missions in a routine manner with greater precision than ever before. MRSI missions can deliver 4 to 8 rounds simultaneously on a single target with near pinpoint accuracy in less than one minute. The Crusader has the ability to do this with it robotic ammunition handling system, which replace the human dimension of having to load the round, powder, and primer separately and manually. Its three man crew sits in a modern aircraft type of cockpit and controls the Crusader with a series of computers much like an F-16 pilot would control his fighting aircraft. Conducting MRSI missions in a MOUT environment gives the maneuver commander the ability to hit specific buildings with near pinpoint accuracy from a ground asset 24 hours a day, seven days a week, and in all weather as opposed to using smart munitions from aircraft which are weather dependent. The Crusader will have the ability to compute its own technical and tactical data much like the AFCS in the Paladin. Its onboard computer system in the cockpit will automatically select the proper shell - fuse combination and the proper number of rounds to service the target in the MOUT environment.[60] Its accuracy is expected to be twice that of the Paladin.[61]

The Crusader will also have an unparalleled command, control, communications and intelligence (C4I) system designed to give the crewmembers a high degree of

situational awareness. This system will give the crewmembers the ability to maintain accurate fire support coordination measures (FSCMs), "monitor and display friendly and enemy locations, maneuver graphics, and the location of battlefield hazards such as obstacles and nuclear, biological and chemical contaminated areas."[62] The onboard C4I system will also have the ability to clear fires in a timely and safe manner by maintaining its situational awareness.[63] The ability to maintain this situational awareness will have great implications in clearing fires and delivering fires where and when the ground commander requires them. This responsiveness and awareness is unparalleled and will assist in the MOUT fight on a level of unprecedented importance.

The Crusader is expected to replace the Paladin on a one for one basis beginning in FY2005. Its increased levels of lethality, accuracy, and responsiveness will provide fires in the MOUT environment that can, when planned appropriately, reduce collateral damage and civilian casualties. Its future state of the art C4I systems will give it the ability to accept fire missions, compute firing data, clear fires, and deliver fires in concert with the operational tempo of the MOUT fight.

The other future weapons platform is a Lightweight 155-mm howitzer. The Army and Marine Corps are developing this

weapon system primarily to provide the light force with improved mobility and greater lethality on the battlefield. Similar to the Crusader the mobility of the lightweight howitzer is not as important as its increased lethality in the MOUT environment. This weapon system will be used by light forces in a general support (GS) role in light divisions. This new howitzer's improvements include an automatic opening breech, automatic primer feeder, and an electronics package that will give it capabilities similar to the Paladin.[64] The electronics package is similar to the AFCS and has the capability to self locate the howitzer and conduct fire mission processing. These improvements will give the light forces the same capabilities as heavy forces in the MOUT environment. These systems aid in delivering accurate fires to the target location, essential to reducing collateral damage and civilian casualties.

The LW 155 is expected to replace the current inventories of the M198 by FY2005. Its increased levels of lethality, accuracy, and responsiveness will provide fires in the MOUT environment that can, when planned appropriately, reduce collateral damage and civilian casualties. Its future state of the art C4I systems will give it the ability to accept fire missions, compute firing data, clear fires, and deliver fires in concert with the operations tempo of the MOUT fight.

All of these weapon system platforms have the capability to improve the MOUT fight now and in the future. However, along with these platform changes, changes are also occurring in the development of ammunition.

B. Munitions

Artillery ammunition now and into the next century will undergo a change that will leave it, with the exception of its traditional shape, virtually unrecognizable in terms of its lethal and non-lethal capabilities. However, not all newly designed ammunition will have the ability to assist in the MOUT environment. One in particular is the SADARM -- sense and destroy munitions. This type of fire and forget munition works on millimeter wave technology that may be negated in an urban environment because of buildings, bouncing radio waves, and the volume of civilian vehicles that may posses characteristics similar to the military vehicles SADARM is designed to destroy. With increased rates of fire and extended ranges, the burden of effectiveness is shifting to munitions rather than the weapons platforms themselves. Because of the changing technology in munitions development the Field Artillery School is moving from platform centrality to munitions centrality. "Guidance capabilities in the munitions will reduce the requirement for firing platform location and

target location accuracy. Emerging munitions technologies promise greater lethality, more versatile terminal effects and, eventually, the ability to perform in-progress battle damage assessment (BDA)."[65] The Marine Corps is also working on field artillery munitions that can assist with the MOUT fight.

The Marine Corps calls for "measured firepower" in an attempt to "deny the enemy the protection he seeks from the urban environment."[66] The desire is to have the ability to attack targets inside buildings, in rubble, and to sub-surface levels like sewer and subway systems. The ability to implode large buildings without damaging surroundings structures is critical to reducing collateral damage and civilian casualties.

Some munitions that the Army's Field Artillery School is exploring are of non-lethal characteristics. The Silent Eyes projectile is a good example of a projectile that can be used as an intelligence gatherer and provide battle damage assessment (BDA) of any type of munitions strike. This 155-mm round will provide real time information from "an expendable imaging sensor and a data transmission link that will send color television imagery and GPS coordinates back to a ground station for dissemination."[67] Other "non-lethal" munitions may incorporate electronic or pyrotechnic

devices that can stun personnel, disable vehicles and disrupt electronic and communications circuits."[68]

Other munitions the Field Artillery community is looking at are munitions that have the capability to conduct in-flight maneuvering. As the projectile travels to its intended target, it will have the capability to alter its path in flight with GPS technology. This type of munition is composed of a new fuse that fits on current projectiles. The fuse is being developed in three phases and is called the Low Cost Competent Munition (LCCM). The first developmental phase is a fuse that has the ability to self-register, the second phase is a fuse that is equipped with canards to slow the projectile, and the third phase will have steering canards to not only slow the projectile but to allow for corrections in deflection.[69] The second and third phase of the development of the LCCM is the most important for urban warfare. The use of this type of technology will increase the accuracy and improve the lethality of munitions.

Munitions and weapons systems are two areas that the Field Artillery is improving that can benefit the MOUT environment. A third area that is essential to delivering fires is in the fire support command and control (C2) structure. Digital connectivity is an essential key to managing and delivering fires. The Advanced Field Artillery

Tactical Data System (AFATDS) is currently being fielded to divisions and corps to replace the Interim Fire Support Artillery System (IFSAS) and the antiquated Tactical Fire (TACFIRE) direction system. Incorporating AFATDS into the current Army Battle Command System (ABCS) is essential to quickly clearing fires. Had the DivArty Commander in Hue had AFATDS his ability to clear fires would be almost instantaneous and he may not have had to establish 11 agencies to control and clear fires. "For the first time, we are technically capable of fire control and fire coordination from the same location -- not split between field artillery tactical operations centers (TOCs) and maneuver FSEs."[70]

AFATDS allows commanders and selected fire support personnel to monitor fire support operations and issue guidance and directions from anywhere on the battlefield. "It is a single, integrated fire support asset manager."[71] This system will operate at all FSEs, Fire Support Coordination Centers (FSCCs), Field Artillery Command Posts, Fire Direction Centers (FDCs), and other selected Field Artillery elements throughout the command. AFATDS is interoperable with the Army Tactical Command and Control System (ATCCS), the Maneuver Control System (MCS), Forward Area Air Defense Command and Control Communications

Intelligence (FAADC3I) System software and the All Source Analysis System (ASAS).[72]

With AFATDS the operator has the ability to input the commander's intent into the fire support plan into the database. This information is then used to prioritize fire missions during the battle. Fire Support Coordination Measures (FSCMs) are also an integral part of AFATDS. Incorporating FSCMs makes clearing fires a quicker process. AFATDS also has the ability to implement FSCMs and other battlefield geometry at times and in places as designated by the fire plan. Observer locations, manned and unmanned, are also uploaded into the AFATDS database. Once the initial data is established every time the observer moves he can send an update to AFATDS. This update is transmitted to an overlay on all AFATDS system the observer has established as his addressees.[73] Having the ability to input and digitally track all of this information makes it quicker and more reliable to clear fires and process fire missions. AFATDS can establish Intervention Points (IPs) that allow the fire mission to stop at certain command levels so that level of command may track and or clear missions in the manual mode.[74]

A drawback of the AFATDS is that it requires inputs and updating by humans and the system will fight the plan as opposed to the enemy. If the enemy situation changes or new

ROE are enacted the AFATDS operator must input the requisite information.

D. Doctrine

Doctrinally the Army tried to ignore the MOUT problem during the Cold War with the expectation that most urban areas would be bypassed.[75] This is no longer possible. "The U.S. doctrinal approach to urban operations had undergone several revisions in recent years in the context of a widening spectrum of conflict and the introduction of new warfighting technologies."[76] Although this has occurred, the latest publications on MOUT are FM 90-10 Military Operations on Urbanized Terrain (MOUT) published on 15 August 1979 and FM 90-10-1, An Infantryman's Guide to Combat in Built-up Areas published on 12 May 1993. The information contained within the manuals pertaining to the use of artillery in a MOUT environment is outdated based on current capabilities and ROE concerns. The latest publication by the Field Artillery School is the previously mentioned White Paper titled Fire Support for MOUT dated February 1989. This White Paper describes tasks to be conducted, methods of adjusting rounds in an urban environment, munitions effects on structures, and the criticality of using indirect fire systems in a direct fire mode.[77] "The brigade FSCOORD (fire support coordinator)

must concern himself with the process by which the fire support is allocated to subordinate units. One of the most critical concerns facing him is whether or not field artillery is to be used in a direct fire role during the battle."[78] Although this is an important decision depending on the amount of fire support assets available it does not really get at the essence of the fire support problem in a MOUT environment. Currently the only formal artillery field manual (FM) that exists for MOUT operations using heavy artillery is in FM 6-20-40, *Tactics, Techniques, and Procedures, Fire Support for Brigade Operations (Heavy)* dated January 1990. In this FM, MOUT operations are buried under Appendix J, Environmental and Terrain Considerations for Fire Support.[79] It describes the characteristics of MOUT as follows.

> Because conflict on urban terrain is becoming more likely, the FSO at any level must be aware of the special considerations for fire support on urban terrain. Specific characteristics of MOUT are as follows:
>
> -- The defender has the advantage.
> -- Freedom to maneuver within the urban area is greatly restricted.
> -- Visibility is reduced because of buildings.
> -- The attacker and the defender have considerable cover and concealment.
> -- Unit boundaries are smaller.
> -- Small-unit operations predominate.[80]

Along with listing the obvious characteristics of MOUT the FM goes on to discuss munitions, target acquisition,

targeting, positioning, and close air support in a somewhat cursory manner.

In addition to the above field manuals and White Paper, there is a School of Advanced Military Studies (SAMS) monograph that discusses fire support in a MOUT environment. "Precision Fire Support For MOUT" is a published monograph that discusses the importance of the combined arms team in a MOUT environment and the role that field artillery plays in that team. This monograph focuses on the need to use precision fires in concert with ROE to reduce collateral damage and civilian casualties.[81] This is perhaps one source the United States Army Field Artillery School can go to develop improved doctrine for indirect fires in a MOUT environment. The United States Marine Corps has published MCWM 3-53.3 in attempt to close the missing gap within their service. It outlines problems that are inherent with fire support in a MOUT environment and does give some advice for the employment of artillery in a MOUT environment. It minimally discusses the command relationships in isolating the objective, securing a foothold, and clearing the objective but does not discuss the technical side of fire support or give advice on the art of fire support in MOUT.[82]

Doctrine development still has a way to go in an effort to incorporate the concerns of MOUT operations and the reality that it may be conducted in the near term. The

Field Artillery community is working on updating its publications. In addition to the currently published manuals and papers listed above, the Warfighting Integration and Doctrine Development (WIDD) department at Fort Sill, Oklahoma is updating current doctrine in MOUT operations. Once these publications surface for review, they will give the personnel in the field an opportunity to assist in updating doctrine for fire support in a MOUT environment.

Section V

Conclusion

The techniques and doctrine for fire support currently under development will assist in overcoming some of the challenges posed by a future MOUT environment. The artillery community has looked forward and is developing weapon systems, munitions, and doctrine to facilitate the use of indirect fire systems in a future MOUT environment. With the current Paladin system, the future Crusader, and LW 155, artillery has the ability to deliver more fires, more accurately than ever before. The future munitions that are in development or on the drawing boards will also have the ability to improve accuracy and lethality in an urban environment. With increased lethality, the logistics tail for the artillery community is reduced. With better doctrine, the artillery community can educate itself and others on tactics, techniques, and procedures governing the use of indirect fires in an urban environment. Improved doctrine should also take into consideration force protection and collateral damage reduction. With improved weapon platforms, munitions, and doctrine, combined with the

desired effects of combined arms operations, heavy field artillery will always have a role in future MOUT operations.

Although fire support does have a future in MOUT operations, the public must be aware of two consequences that result from conducting MOUT operations. The first is that there is no such thing as a true "surgical strike" in a MOUT environment. Buildings hit with any type of munitions are destroyed and will have to be rebuilt. Also, any building targeted and hit has the potential to collapse and destroy nearby structures. Collateral damage can be limited only so much when explosives are involved. The infrastructure of a city or any urban area is at risk regardless of the weapons system used. The military should conduct operations with force protection in mind first and collateral damage second. This was evident in the Battle of Hue. Initial engagements were conducted without the use of any type of indirect fires. It took three weeks of fierce fighting before indirect fires were allowed into the fight. This, however, does mean that indiscriminate shelling such as that conducted by the Russians in Chechnya should be allowed. The IDF, with the exception of their "disproportionate response" policy, effectively combined force protection with effective military power in their siege of Beirut.

Secondly, the public must be made aware of the fact that MOUT operations are costly, both financially and in terms of lives lost. Anytime a unit enters a city or village with the intent of seizing control the defender has the advantage. The defender's advantage is a disadvantage to the infantryman or the crew of the tracked vehicle that supports the conduct of house to house clearing operations. If the public accepts these two consequences then the prosecution of a MOUT fight may be more palatable by the warfighter and certainly easier for the artillery to execute.

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